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Bio-Preservation of Yoghurt Quality and Safety by Nisin Nanoparticles Prepared by acetic acid Precipitation Method

This study aimed to prepare nano-nisin using new, natural, safe nanoprecipitation method by acetic acid for food application. The fabricated nano-nisin stability was investigated freshly and after 6th months by zeta-sizer (the PDI was 0.227; 0.431 with dynamic nm 26.55; 86.50 nm) and TEM (9.35 and 12.4 nm with spherical, separate shape), respectively by addition organic component during preparation. Also, the FTIR for detection the active functional groups was determined. The nano-nisin exhibited a higher antibacterial activity against methicillin resistant *Staphylococcus aureus* (MRSA) and *E.coli* O157:H7 in vitro by using agar well diffusion method (the MIC of nano-nisin for both organisms was 0.125 mg/ml). The cytotoxicity assay of used concentration was safe on VERO cells. In vivo, inoculation of nano-nisin in yoghurt at 0.25 and 0.125 mg/ml concentrations, it could be complete eradication of MRSA and *E.coli* O157:H7 after 24hrs and at 5th day, respectively at 0.25mg/ml. Effect of nano-nisin on pH and organoleptic properties of inoculated yoghurt at different concentrations were assessed during refrigerator storage. The organoleptic properties were revealed high acceptance of yogurt containing different concentrations of nano-nisin with good pH up tell 5th day. The shelf life of inoculated yoghurt with nano-nisin (0.25%) was exceeded than negative control group that could suggested nano-nisin by this method as a safe for food preservative. It has been observed that health-conscious consumers have a stronger preference for yoghurt due to its wide range of nutritional and therapeutic benefits. Due to a few technical issues, such as high post acidification, manufacturers were unable to satisfy their customers. The use of nisin in yoghurt will solve all of the technological issues while also broadening the market.

Keywords: MRSA ; *E.coli* O157:H7; Yoghurt; FTIR; Cytotoxicity; Food preservative.

Biography

Walaa M. Elsherif, a deputy of technical manager at food hygiene department (certified by ISO 17025:2017 and ISO 9001:2018), and consultant of nanotechnology research unit at animal health research institute, Certified as a reviewer in different international journal and have many international publicities (in English and Arabic languages) also I had share in three books. Member of OWSD and certified from AUC and DAAD Kairo Akademia. Supervisor on many thesis. Have many scientific lectures in many fields and get many prizes from different international conferences. Also, share in many social services.